Oral | Symbol S (Solid Earth Sciences) | S-SS Seismology

[S-SS34_29AM1]Active faults and paleoseismology

Convener:*Takashi AZUMA(National Institute of Advanced Industrial Science and Technology), Nobuhiko Sugito(Faculty of Humanity and Environment, Hosei University), Satoshi Tonai(Department of Applied Science, Faculty of Scienece, Kochi University), Toshikazu Yoshioka(Active Fault and Earthquake Research Center, National Institute of Advanced Industrial Science and Technology), Chair:Taku Komatsubara(Institute of Geology and Geoinformation, Advanced Industrial Science and Technology), Nobuhiko Sugito(Faculty of Humanity and Environment, Hosei University)

Tue. Apr 29, 2014 9:00 AM - 10:48 AM 502 (5F)

Geologic and historic information on seismic cycles and on the magnitude and source faults of past earthquakes is essential information to understand future large earthquakes. The study of past faulting and seismicity is an important issue for an interdisciplinary community of seismologists, geologists, geomorphologists, archaeologists, and historians.

10:30 AM - 10:45 AM

[SSS34-P03_PG]Examination of evaluation method for fault activity based on an observation of fault zone - 1. Selection of outcrops -

3-min talk in an oral session

*Masao KAMETAKA[1], Kazuhiko OKAZAKI[1], Kazuhiko NAKAYAMA[2], Kazuyoshi SESHIMO[2], Kazuhiro AOKI[2], Yoshihiro TANAKA[2], Koji SHIMADA[2], Kota SHIMOGAMA[1], Noriyuki INADA[1] (1.Dia Consultants, 2.Japan Atomic Energy Agency)

Keywords:active fault, evaluation method of fault activity, Rokko Mountains, Gosukebashi Fault, Rokko Fault, fault zone

The activity of a fault is normally evaluated by observing the displacement/deformation of strata which cover the fault. However, it is difficult to evaluate the activity of a fault which exists only in the basement rock without any overlying strata. In such a case, the fault activity needs to be judged carefully through a comprehensive approach to geomorphology, geology and present/past stress fields. Items in analyzing a fault zone include observation of the fault plane, width of fracture zone, color, hardness, magnetic susceptibility, form of fractured material, mineral and chemical composition analysis, dating, etc. Since some of these items have uncertainties in quantification and reproducibility, a method for evaluating fault activity by analyzing the fault zone in the basement rock is yet to be established. The authors have been carried out the observation and analysis of the fault zone to establish more scientific method of evaluation of fault activity.In order to do the survey of certain active fault, we should study the outcrop of fault which give a displacement/deformation to the overlying certainly younger formations, and should observe the extension of fault from the overlying formations to the basement rocks. On the other hand, in order to do the survey of the fault zone of certain non-active fault, we should study the outcrop of fault which is covered by the old enough formations from the evaluation point of view.We selected the outcrops which fulfilled the above-mentioned conditions through literature, then we decided the study outcrops through geological survey. The study area are limited in granite-bearing area, because granite show generally homogeneous and simple structure, is widely distributed in land, and well documented about fault rocks.Examples of outcrops of active fault are one of the Gosukebashi Fault (Loc. 5 of Maruyama et al., 1997, Active Fault Res.) and one of the Rokko Fault (Loc.1 of Maruyama and Lin, 2002, Tectonophysics) in the Rokko Mountains, southern Hyogo

Prefecture.The fault zone of the Gosukebashi Fault appears in the Rokko Granite at the upperstream of the Gosuke-Dam site. Sand and gravel beds are bounded with granitic fault zone in the upper part of the outcrop. The fault zone consists of thick fault gouge in black and brown color, foliated cataclasite and granitic cataclasite. At the western Funasaka, the Rokko Granite is in contact with rhyolitic volcaniclastic rocks of the Arima Group and overlying gravel beds through the Rokko Fault. The fault zone of the granite are remarkably altered and composed of brown fault gouge, foliated cataclasite and granitic cataclasite. The fault zone of the rhyolite is composed of black Fe-Mn-bearing layer, rhyolitic cataclasite and damaged rhyolite.An example of non-active fault was selected from the fault which does not effect the strata of higher terrace deposits. Higher terrace deposits surrounded by badlands of weathered granite are well developed around the Rokko Horai-kyo in the northern Rokko Mountains. The fault including relatively thick gouge which is overlain by the deposits was selected for this survey, and is named the Rokko Horai-kyo Fault. For keeping the safety against the rock fall, the survey has done in the lower extension of granitic slope from the unconformity. The fault zone appears in the weathered granite, and composed of brown gouge, with black Fe-bearing layer and cataclasite.The observation of fault zone (evaluation of fault plane, in-situ measurements of color and hardness), striation analysis, observation of fault structure by slabs, sections and SEM samples, mineral composition (XRF) and chemical composition (ICP-MS) analysis, mechanical and physical tests were done at the fault zones of these 3 faults. In this paper, the outline of this study and the results of geological survey are described. The details of the observation results of fault zones are explained in another paper (Okazaki et al., 2014, Abs